

REMARKS

This is in response to the Official Action currently outstanding in the above-identified application, which Official Action the Examiner has designated as FINAL.

Applicants respectfully thank the Examiner for the courtesy accorded to their undersigned attorney during recent telephone discussions concerning potential further amendments to independent Claim 18 and the facts and arguments summarized in these Remarks. No substantive agreement was reached in the course of these telephone discussions; however, it is Applicants' attorneys' understanding that the Examiner agreed to reconsider this application in response to this Amendment After Final Rejection Under 37 CFR 1.116 and to issue an appropriate Advisory Action in due course.

Claims 3-5, 7, and 18-20 were presented for consideration. Claims 3-5, 7 and 18-20 stand rejected in the currently outstanding Official Action that has been designated as being FINAL. By the foregoing Amendment, Applicants propose that Claim 18 be amended in a manner that is respectfully submitted to improve the phraseology thereof, and to clarify the invention heretofore claimed. No claims have been added, and no claims have been canceled. Further, it is respectfully submitted that the foregoing Amendment does not introduce into this prosecution any new issues requiring further consideration and/or search. In addition, it is respectfully submitted that the foregoing amendment, if entered, will place this application in condition for allowance, or at least in better form for Appeal, as required by 37 CFR 1.116.

A statement of the claims as they will stand in the event that the Examiner grants entry to this Amendment is set forth hereinabove as required by the Rules. Accordingly, in the event that this Amendment is entered, Claims 3-5, 7 and 18-20 as hereinabove amended will constitute the claims under active prosecution in this application.

In the currently outstanding Official Action, the Examiner has:

1. Failed to re-acknowledged Applicants' claim of foreign priority under 35 USC 119(a)-(d) or (f), and re-confirmed the safe receipt of the priority document for this application by the United States Patent and Trademark Office.

Appropriate re-acknowledgement and re-confirmation in response to this communication is respectfully requested. Further, formal confirmation of the acceptance of the corrected drawings filed on 3 May 2000 remains missing from the Applicants' file for this case. **Confirmation of the acceptability of those drawings in response to this communication therefore also is respectfully requested in response to this communication.**

2. Provided Applicants with a copy of a Notice of References Cited (PTO-892), copies of the newly cited references.

3. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Kim, et al. reference (U.S. Patent No. 5,933,208) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), the Miyawaki et al reference (U.S. Patent 5,822,028), the Miyawaki, et al reference (U.S. Patent No. 5,757,054) the Japanese reference JP7-152022, the Ono reference (U.S. Patent No. 6,057,900), and the Masaki reference (U.S. Patent No. 4,538,884).

4. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Noda, et al. reference (U.S. Patent No. 5,585,951) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), the Miyawaki et al reference (U.S. Patent 5,822,028), the Miyawaki, et al reference (U.S. Patent No. 5,757,054) the Japanese reference JP7-152022, the Ono reference (U.S. Patent No. 6,057,900), and the Masaki reference (U.S. Patent No. 4,538,884).

5. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Kawabe, et al. reference (U.S. Patent No. 6,162,654) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), the Miyawaki et al reference (U.S. Patent 5,822,028), the Miyawaki, et al reference (U.S. Patent No. 5,757,054) the Japanese reference JP7-152022, the Ono reference (U.S. Patent No. 6,057,900), and the Masaki reference (U.S. Patent No. 4,538,884).

6. Provided Applicants with his response to their previously filed Amendment.

With regard to items 1 and 2, further detailed discussion in these Remarks is not believed to be necessary.

With regard to items 3 - 5, Applicants respectfully call the Examiner's attention to the fact that an amendment of Claim 18 is herein proposed for the purpose of improving the phraseology and clarity of that claim. In particular, as previously worded, Claim 18 called for "a first insulative substrate on which picture electrodes are aligned in a matrix configuration defining an image display region". Further, Claim 18 previously called for "a light shielding frame layer defining an inner edge and being disposed such that said inner edge is located **substantially adjacent** to the outermost ones of the picture element electrodes **in closely surrounding relationship** with said display region".

Applicants' intent in the selection of the above phraseology of the single pending independent claim of this application was to clearly indicate that the periphery of the display region and the inner edge of the light shielding frame layer were to be disposed adjacent to one another **in the same plane, or at least on the same surface**. In particular, Applicants believed that the inner edge of the light shielding frame layer could not **closely surround** the display region unless the outwardly facing edges of the outermost ones of the matrix array of picture element electrodes defining the display region in any way other than in a configuration in which the inner edge of the light shielding layer was positioned so as to directly oppose the portions of the outer picture elements of the matrix array defining the peripheral boundaries of the display region. In any other relationship, the light shielding frame layer would surround some other structure such as the support for the picture element electrodes or the color filters located above or below the picture element electrode array defining the display region.

As will be discussed further below, the Examiner unfortunately appears not to have recognized the importance of the phraseology chosen by the Applicants to convey the just described intent in the Claim 18. It has occurred to the Applicants that the reason for this is perhaps because the Examiner has heretofore considered both the claimed structure and the structures of the various references from a vantage point looking down upon the display region rather than cross-sectionally. If this is indeed the case, Applicants respectfully submit that the Examiner heretofore has misunderstood the relationships among the elements claimed because the perspective from which the Examiner has considered the various structures does not reveal those relationships. In other words, by viewing the structures of the present invention and the cited art from a perspective looking downwardly onto the display regions thereof, the Examiner has been lead by the optical illusion that the various element reside in the same plane to draw conclusions concerning the relationships of the claimed elements to one another that are clearly and demonstratively incorrect once the structures under consideration are considered from a cross-sectional perspective.

It must be understood that a very important feature of the present invention is that the inner edge of the light shielding frame layer and the outer periphery of the display region as defined by the outwardly facing edges of the outermost ones of the picture elements that define that display region are ***substantially adjacent to one another in essentially the same plane, i.e., on the same surface***. The reason for this is that it is only when this condition is met that the light rays can be prevented from wrapping around an edge portion of the display region so as to adversely effect the quality of a display in the display region. In this regard, the Examiner's attention is respectfully directed to Figs. A and B of the attached Exhibit I.

Figure A shows the situation achieved by the present invention, namely, **no** light rays are allowed to wrap around the peripheral edge of the display region so as to enter the region between the picture element electrodes and the counter electrode on the opposite substrate so as to adversely effect a picture displayed by the device. Figure B, on the other hand, shows the conditions that are allowed to exist by the prior art references upon which the Examiner relies taken either alone or in combination with one another; namely, **some** light rays are allowed to wrap around the peripheral edge of the display region so as to enter the region between the picture element electrodes and the counter electrode on the opposite substrate so as to adversely effect a picture displayed by the device.

Accordingly, it will be understood that whether a peripheral black matrix frame ("light shielding frame layer") resides on the counter substrate or otherwise in a different plane (on a different surface) from the display region defined by the picture electrodes on the first substrate, the goal of the present invention of preventing back light from wrapping around the peripheral edges of the display region and adversely effecting a picture displayed by the picture electrodes defining the display region cannot be fully achieved. It is only when the inner periphery of the light shielding frame layer substantially abuts (closely surrounds) the outer periphery of the display region **on the same surface (in the same plane)** that the desired result of the present invention is achieved. Hence, it is respectfully submitted that the Examiner has heretofore misunderstood the present invention by virtue of the fact that he has viewed the various structures claimed and the various structures of the prior art from a vantage point (perspective) looking down upon the respective display regions, a vantage point that prevents the observer from focusing upon the important, novel and non-obvious relationships and results of the present invention.

Once the invention being claimed is appropriately understood, the standards for the establishment of a so-called "*prima facie*" case of the obviousness thereof under 35 USC 103 are well settled. For example, it is stated in MPEP Section 2142 that:

"...(t)o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. **The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)" Emphasis added**

It is respectfully submitted that in the present circumstances the Examiner's currently outstanding rejections fail to meet the foregoing standards.

A brief summary of the points of distinction between the various art cited by the Examiner and the present invention, the claims to which are hereinabove clarified, is instructive in this regard.

The cited Kim reference (US 5,933,208) discloses an arrangement in which a resin black matrix is formed on the TFT's located in the display region through a protective film. As the Examiner has noted, however, the Kim reference does not teach, disclose or suggest the structure surrounding the display region. Accordingly, the Kim reference fails to teach, disclose or suggest the essential feature of the present invention that the inner edge of a light shielding frame layer is located substantially adjacent to the outermost ones of the picture element electrodes defining the display region or the advantages of that structure, i.e., that the relative locations of the inner edge of a light shielding frame layer and the outer edge of the elements defining the display region completely prevent the emission of light rays into a portion of the device between the picture element electrodes and the counter electrode by the wrapping of dispersed back light rays around the edges of the display region.

The Shirahashi et al reference (US 5,285,301) discloses a construction in which a light shielding layer is formed in a non-display region counterpart portion of a counter substrate such that a gap can exist between the light shielding layer and the picture element electrodes defining the display region on a transistor forming substrate. Accordingly, in Shirahashi et al it is impossible to prevent the emission of light rays into a portion of the device between the picture element electrodes and the counter electrode by the wrapping of dispersed back light rays around the edges of the display region.

The Sato et al reference (US 6,081,305) discloses the formation of picture element electrodes, i.e., reflection electrodes, on a light shielding layer disposed on the periphery of picture display regions through an insulating layer. This is different from the arrangement of the present invention in that a gap is provided between the light shielding layer and the picture element electrodes. Thus, it is impossible to prevent the emission of light rays into a portion of the device between the picture element electrodes and the counter electrode by the wrapping of dispersed back light rays around the edges of the display region. This is because, as shown in the attached Fig. B, dispersion light is generated at an edge of the light shielding layer and a portion of that dispersion light is transmitted through the picture element electrode and a liquid crystal layer region provided on the picture element electrode. When a gap exists by virtue of the presence of an interlayer insulating layer between the light shielding layer and the picture element electrode, the transmission path of the light rays becomes longer, and light rays are emitted further into the inner side of the picture element electrode. The result is a decrease in display quality caused by the distributed light transmitted through the picture element electrode.

The Miyawaki reference (US 5, 822,028) discloses an arrangement in which a light shielding layer is formed on a peripheral driving circuit, and the light shielding and picture element (reflection) electrodes are respectively formed on different layers. Accordingly, a gap is formed between the light shielding layer and the picture element reflection electrode. The advantages of the present invention are not possible because of the emission of light into a portion of the device between the picture element electrodes and the counter electrode by the wrapping of dispersed back light rays around the edges of the display region.

The Miyawaki et al reference (US 5,757,054) discloses a display unit wherein a liquid crystal is disposed between a light shielding metal layer at the periphery of a display region and a picture element reflection electrode, and a gap is formed between the light shielding metal layer and the picture element reflecting electrode due to the existence of the liquid crystal. Accordingly, for the same reasons as stated above this the device disclosed by this reference also cannot obtain the above-mentioned advantages of the present invention.

The JP7-152,022 discloses an arrangement in which a picture element electrode is formed separated from a light shielding film at its periphery by a protective film. Accordingly, a gap is provided between the picture element electrode and the light shielding film at the periphery, and for the reasons previously mentioned, the arrangement cannot achieve the above-described advantages of the present invention.

The Ono reference US 6,057,900 discloses an arrangement wherein a black matrix is formed at the peripheral portion of a color filter on a counter substrate, and a transparent electrode, i.e., a picture element electrode, is located on an opposing film transistor forming substrate, and a liquid crystal layer is provided between the transparent electrode and the black matrix. Therefore, for the reasons previously stated, the arrangement cannot achieve the above-mentioned advantages of the present invention.

The Masaki reference US 4,538,884 discloses an arrangement wherein a light shielding layer is formed through a transmission insulating layer onto the outermost reflection mirror among mirrors formed in a matrix shape, and a gap is provided between the light shielding layer and the reflection mirror. Therefore, for the reasons previously stated, the arrangement cannot obtain the above-mentioned advantages of the present invention.

The Noda et al reference US 5,585,951 discloses an arrangement wherein a black-matrix is formed on a counter substrate separated by a liquid crystal layer from a picture element electrode disposed on a main substrate. A gap therefore exists, but as the Examiner admits the reference fails to disclose the peripheral construction of the device. Accordingly, while it is believed that this reference fails to disclose or suggest the above-mentioned essential feature of the present invention and the advantages of the present invention, the disclosure of the reference is not sufficient to make this assertion definitively as the Examiner has specifically recognized.

The Kawabe et al reference (US 6,162,654) discloses an arrangement wherein a black-matrix is formed through a passivation film on a TFT substrate. Accordingly, while it is believed that this reference fails to disclose or suggest the above-mentioned essential feature of the present invention and the advantages of the present invention, the disclosure of the reference is not sufficient to make this assertion definitively as the Examiner has specifically recognized.

The Zhang reference US 005995189 discloses an arrangement wherein a black matrix is formed at the surface of a passivation film disposed on the uppermost layer of a substrate-gap-compensation means, forming a region of seal element. This reference too fails to disclose or suggest the above-mentioned essential feature of the present invention for the reason mentioned above.

The Iida reference US 00638872B1 discloses an arrangement wherein a metal light shielding layer is formed through an interlayer insulating film onto a multi-crystal silicon film of a peripheral circuit portion. It is impossible to shield unnecessary light emitted from a driving circuit in this device. Accordingly, it too fails to disclose or suggest the above-mentioned essential feature of the present invention and the advantages of the present invention.

Hindsight is 20/20. Therefore, it is easy to reason that since the primary references when viewed from a vantage point above the display regions seem to show a light shielding layer (black matrix) filling the gaps between the picture electrodes on a first substrate that those skilled in the art would use an extension, or at least a separate portion of, that layer for light shielding functions at other desired locations on the first substrate. It also is easy to intuitively reason from this premise that persons skilled in the art would attempt to avoid the creation of separate light shielding layers, if possible. The problem, however, is that neither the primary nor the secondary art relied upon by the Examiner discloses the presence of the black matrix in the same plane as (on the same surface as) the picture electrodes defining the display area. To the extent that the art appears to show this, Applicants respectfully submit that it is an optical illusion derived from viewing the structures considered by the Examiner from the vantage point from which the Examiner has to date apparently viewed the prior art and the structure claimed in the present application.

In summary, therefore, the present application presents a classic case of the application of hindsight reasoning and/or so-called "obvious-to-try" logic in the examination of the claims of an application before the United States Patent and Trademark Office in combination with a misunderstanding of both the invention being examined and the prior art resulting from the viewing of the structures of the invention and the art from a deceiving vantage point. In particular, the Examiner has located art showing the use of a black matrix around the peripheries of (but not in the same plane as or on the same surface as) the picture elements on a first substrate. To this the Examiner nevertheless engrafts the general concept that a black frame surrounding the display region in such a setting is generally known in the art citing art to show "active matrix devices with black layers in the extending peripheral regions" ***while at the same time admitting that the primary art that he has located does not show either this or the location of that frame on the same substrate as the black matrix surrounding the picture elements.***

Hence, Applicants respectfully submit that the very evidence that the Examiner has attempted to utilize to support his position in fact shows the reverse, i.e., that a person of ordinary skill in the liquid crystal art during the 1990's would, and in fact did, place the peripheral frame on the substrate opposite to that herein claimed. Further, even in those case wherein the light shielding layers between the picture element electrodes resided on the same substrate as the picture element electrodes, those light shielding layers did not lie in the same plane or on the same surface as the picture element electrodes. Therefore, all of the presently claimed limitations are not disclosed in the cited art in the context in which they appear and are claimed in this invention. Further, there is no clear suggestion that those elements even if abstractly shown in that art should be combined in the manner herein claimed.

Any such suggestion for making the combination postulated by the Examiner comes from the Applicants' specification, not the cited prior art. Similarly, the suggestion that one skilled in the art would simply extend the light shielding layers of the primary references to achieve the light shielding frame layer taught herein is belied by the fact that the light shielding layers of the primary references lie in noncontiguous relation to one another and thus do not achieve the goal of the present invention.

Stated slightly differently, the Examiner's intuitive feeling apparently has heretofore been that since a peripheral frame area surrounding a display region is in his estimation well known in the art, the one of the substrates and/or the type of substrate upon which that peripheral frame area is disposed are essentially irrelevant details that may be disregarded in his examination of the present claims. Thus, the Examiner has located art showing a black matrix "surrounding" picture elements (in different planes) on an insulative substrate, but that art fails to disclose the peripheral area claimed.

Accordingly, the Examiner proceeds to state as a general proposition that peripheral areas surrounding display areas containing picture elements within a black matrix are well known in the art and cites various secondary art to support his position. Then, from the primary art cited and the general proposition stated as allegedly supported by the secondary references, the Examiner concludes that the present invention is obvious without specific regard to its detailed provisions concerning the nature of the substrate and/or the one of the substrates upon which both the black matrix and the black peripheral area are disposed, and/or the special relationships of the picture element electrodes and the components of the black matrix whether the same be on a counter substrate relative to the display region or on the same substrate as the display region.

Once the Applicants demonstrated that the secondary art cited in support of the general proposition is insufficient to teach, disclose or suggest in combination with the primary references all of the elements of the claimed invention, the Examiner suggests that Applicants have failed to deal with the combination of references upon which his rejections are based. As noted, however, this begs the question. The point is that the secondary art cited does not show the limitations of the present claims that the Examiner has admitted are not disclosed, taught or suggested by the primary references. For these reasons in addition to the differences between the present invention and the cited art enumerated above, Applicants respectfully submit that the Examiner's rejections are inadequate to satisfy the burden of proof necessary to reject the present claims as being unpatentable under 35 USC 103(a).

For each, and all, of the foregoing reasons, Applicants submit that the Examiner's currently outstanding rejections are in error as constituting the application of improper hindsight reasoning and/or an improper "obvious-to-try" standard of patentability to an erroneous understanding of the invention being claimed. Therefore, Claims 3-5, 7, 18, 19 and 20 of this application, as they will stand upon the entry of the foregoing Amendment, are in condition for allowance. Reconsideration, entry of the foregoing Amendment, and allowance of this application in response to this communication are respectfully requested.

Applicants also believe that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

Date: June 26, 2003

By: David A. Tucker
David A. Tucker
Reg. No. 27,840
Attorney for Applicant(s)

EDWARDS & ANGELL, LLP
P.O. Box 9169
Boston, Massachusetts 02209
(617-517-5508)